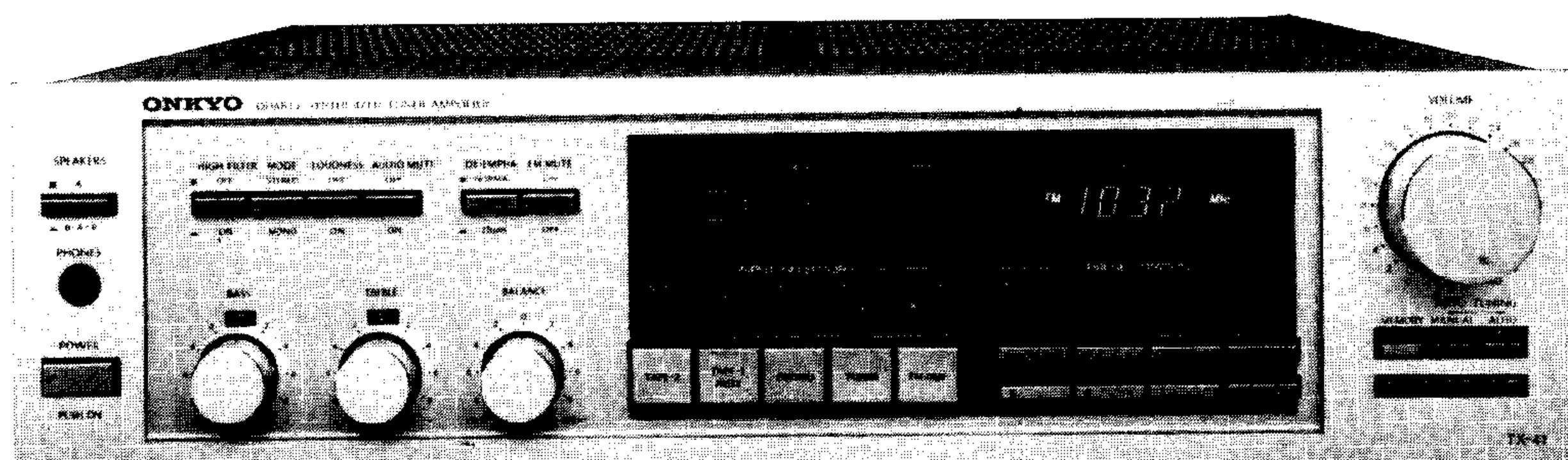


ONKYO® SERVICE MANUAL

QUARTZ SYNTHESIZED TUNER AMPLIFIER MODEL TX-41



ONKYO®
AUDIO COMPONENTS

SPECIFICATIONS

AMPLIFIER SECTION

| | |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Output Power: | 30 watts per channel, min. RMS, at 8 ohms both channels driven, from 20 Hz to 20,000 Hz, with no more than 0.06% total harmonic distortion. |
| Total Harmonic Distortion: | 0.06% at rated power 0.06% at 1 watt output |
| IM Distortion: | 0.1% at rated power 0.06% at 1 watt output |
| Damping Factor: | 35 at 8 ohms |
| Frequency Response: | 20 Hz — 30,000 Hz (± 1 dB) |
| RIAA Deviation: | 20 Hz — 20,000 Hz (± 0.8 dB) |
| Sensitivity & Impedance: | Phono: 2.5 mV, 50 k Ω Tape Play: 150 mV, 50 k Ω Tape Rec: 150 mV, 3.5 k Ω (PH) |
| Phono Overload: | 110 mV R.M.S. at 1 kHz, 0.06% T.H.D. |
| Signal-to-Noise Ratio: | Phono: 85 dB (at 10 mV input A weighted) 75 dB (IHF A-202) Tape: 95 dB (A weighted) 80 dB (IHF A-202) |
| Tone Controls: | Bass: ± 12 dB at 100 Hz Treble: ± 10 dB at 10 kHz |
| Loudness: | +9 dB at 40 Hz +5 dB at 20 kHz |

TUNER SECTION (120 V model)

FM:

| | |
|-----------------------------|-------------------------------------------------------------|
| Tuning Range: | 87.5 — 108 MHz (100 kHz steps) |
| Usable Sensitivity: | Mono: 11.2 dBf, 2.0 μ V Stereo: 19.2 dBf, 5 μ V |
| 50 dB Quieting Sensitivity: | Mono: 17.2 dBf, 4.0 μ V Stereo: 37.2 dBf, 40 μ V |
| Capture Ratio: | 1.5 dB |
| Image Rejection Ratio: | 45 dB |
| IF Rejection Ratio: | 80 dB |
| Spurious Rejection Ratio: | 80 dB |
| Signal-to-Noise Ratio: | Mono: 71 dB Stereo: 66 dB |
| Alternate Channel Att.: | 55 dB |
| AM Suppression Ratio: | 50 dB |
| Harmonic Distortion: | Mono: 0.15% Stereo: 0.3% |
| Frequency Response: | 30 Hz — 15,000 Hz (± 1.5 dB) |
| Stereo Separation: | 40 dB at 1 kHz 30 dB at 100 Hz — 10,000 Hz |
| Muting Level: | 17.2 dBf, 4 μ V |
| Stereo Threshold: | 17.2 dBf, 4 μ V |

AM:

| | |
|------------------------|-------------------------------|
| Tuning Range: | 520 — 1710 kHz (10 kHz steps) |
| Usable Sensitivity: | 30 μ V |
| Image Rejection Ratio: | 40 dB |
| IF Rejection Ratio: | 30 dB |
| Signal-to-Noise Ratio: | 40 dB |
| Harmonic Distortion: | 0.8% |

TUNER SECTION (220 V model)

FM:

| | |
|-----------------------------|-------------------------------------------------------------|
| Tuning Range: | 87.5 — 108 MHz (50 kHz steps) |
| Usable Sensitivity: | Mono: 11.2 dBf, 2.0 μ V Stereo: 19.2 dBf, 5 μ V |
| 50 dB Quieting Sensitivity: | Mono: 17.2 dBf, 4.0 μ V Stereo: 37.2 dBf, 40 μ V |
| Capture Ratio: | 1.5 dB |
| Image Rejection Ratio: | 80 dB |
| IF Rejection Ratio: | 90 dB |
| Spurious Rejection Ratio: | 90 dB |
| Signal-to-Noise Ratio: | Mono: 71 dB Stereo: 66 dB |
| Selectivity: | 50 dB (± 300 kHz, 40 kHz Devi.) |
| AM Suppression Ratio: | 50 dB |
| Harmonic Distortion: | Mono: 0.15% Stereo: 0.3% |
| Frequency Response: | 30 Hz — 15,000 Hz (± 1.5 dB) |
| Stereo Separation: | 40 dB at 1 kHz 30 dB at 100 Hz — 10,000 Hz |
| Muting Level: | 17.2 dBf, 4 μ V |
| Stereo Threshold: | 17.2 dBf, 4 μ V |

AM:

| | |
|------------------------|------------------------------|
| Tuning Range: | 522 — 1611 kHz (9 kHz steps) |
| Usable Sensitivity: | 30 μ V |
| Image Rejection Ratio: | 40 dB |
| IF Rejection Ratio: | 30 dB |
| Signal-to-Noise Ratio: | 40 dB |
| Harmonic Distortion: | 0.8% |

GENERAL

| | |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Power Supply: | 120 V, 60 Hz (D model) 220 V, 50 Hz (G model) 120/220 V, 50/60 Hz (W model) |
| Outputs: | Speaker A & B, Phones, Tape Rec. Out 1 & 2, AC Outlet (unswitched) (Only D model) Phono, Tape Play 1 & 2, FM and AM Antennas |
| Antennas: | FM: 300 ohms balanced and 75 ohms unbalanced AM: built-in loop antenna and external terminal |
| Semiconductors: | 6 FET, 22 transistors, 11 ICs, 74 diodes |
| Dimensions (WxHxD): | 418 x 114 x 392 mm 16-1/2" x 4-1/4" x 15-7/16" |
| Weight: | 7.7 kg, 17 lbs. |

* Specifications and features are subject to change without notice.

PRECAUTIONS

1. Replacing the MOS IC

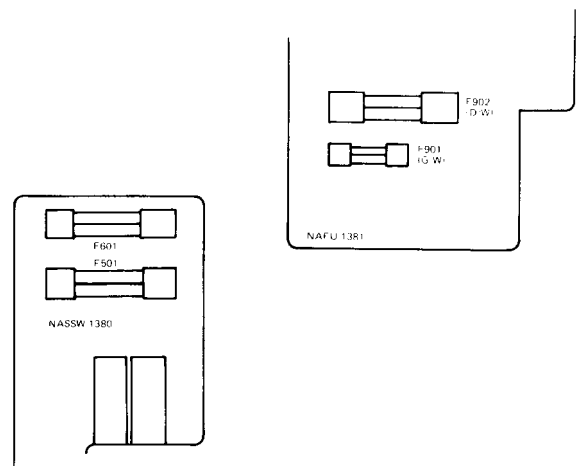
1. All MOS devices should be stored or transported in materials that are somewhat conductive. MOS devices must not be inserted into conventional plastic "snow" or plastic trays.
2. All MOS devices should be placed on a grounded bench surface and operators should ground themselves prior to handling devices, since a worker can be statically charged with respect to the bench surface.
3. Nylon clothing should not be worn while handling MOS circuits.
4. When lead straightening or hand soldering is necessary, provide ground straps for the apparatus used.
5. Double check test equipment setup for proper polarity of voltage before conducting parametric or functional testing.
6. All unused device inputs should be connected to V_{DD} or V_{SS}.

2. Replacing the fuses

Remove the top cover. The speaker protection fuses are located on the speaker switch pc board. The primary fuses are located on the fuse holder pc board as shown in the fig.1.

Caution: For continued protection against fire hazard, replace only with same type and same rating fuse.

| | Circuit No. | Parts No. | Description | Remarks |
|--------------|-------------|-----------|--------------|----------------|
| Speaker fuse | F501, F601 | 252059 | 4A (SS-2) | 120V model |
| | F501, F601 | 252076 | 3.15A-SE-EAK | 220V model |
| | F501, F601 | 252014 | 4A-T | 120/220V model |
| Primary fuse | F902 | 252049 | 4A (ST-6) | 120V model |
| | F901 | 252074 | 2A-SE-EAK | G/W models |
| | F902 | 252014 | 4A-T | 120/220V model |



SPECIAL MODES OPERATION

1. Memory Preservation Batteries

Because stations stored in the memory by the FM/AM preset keys would normally be lost when power is turned off or the plug removed from the wall socket, this unit requires two memory preservation batteries to preserve the contents of the memory even when power is turned off. Be sure to insert the correct type of two batteries into the battery holder in the bottom of the unit before turning on power for the first time.

| Type | Voltage (V) | IEC | United States | | | | | | | | | United Kingdom | | West Germany VARTA (Pertrix) | France S A F T (Leclanché) | Denmark Hellesens | Italy Supper Pila | Australia Eveready |
|-----------|----------------|-----|---------------|------|----------|---------|--------------|----------------|---------|--------|-------|---------------------|-------------------|------------------------------------|----------------------------------|----------------------|----------------------|-----------------------|
| | | | ANSI | NEDA | Eveready | Mallory | Ray-O Vac | Bright Star | Burgess | RCA | Sears | Eveready (BEREC) | Mallory | | | | | |
| Manganese | 1.5 | R6 | AA | 15P | 815 | M15P | 710 | 59P | 920 | VS734 | 8950 | SP12 SP12 HP7 | 251 244 280 | R6S R6B T3S | VI 18 VI 28 VI 38 VI 75 | 63 | 915 1015 | |
| | | | | 15F | 915 | M15F | 7AA | 59 | 910 | VS034A | | | | | | | | |
| | | | | 15 | 1015 | M150F | 15 | 0199 | 930 | VS334 | | | | | | | | |
| | | | | 15D | 1215 | M1504 | 5AA | | | | | | | | | | | |

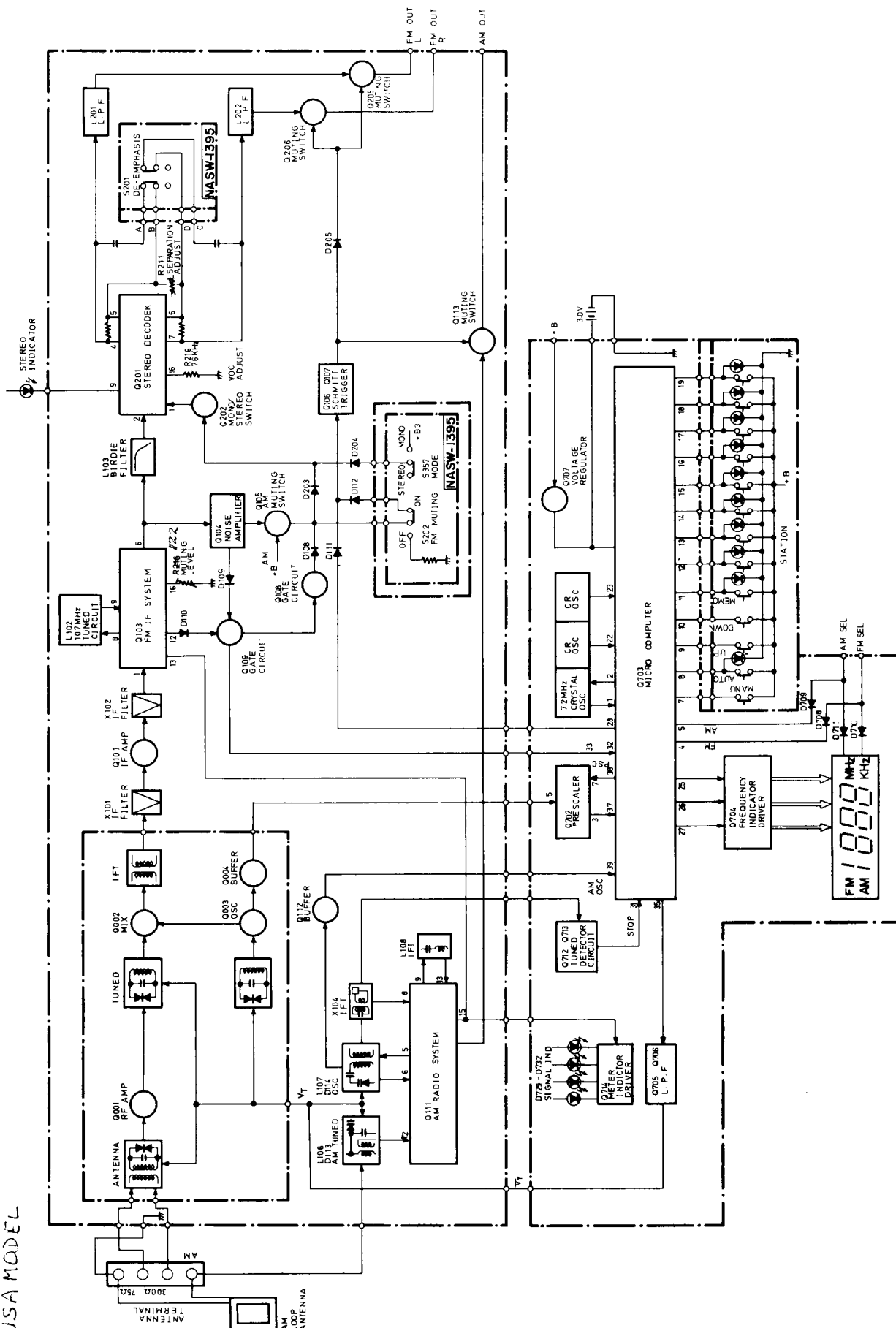
2. De-emphasis switch (Only W model)

The 50 μ sec/75 μ sec selector switch employed in the W (120/220V) model is located on the bottom board. When shipped from the factory, this switch is set to the 50 μ sec position. For use 75 μ sec regions, switch over to the 75 μ sec position.

3. Voltage Selector (Only W model)

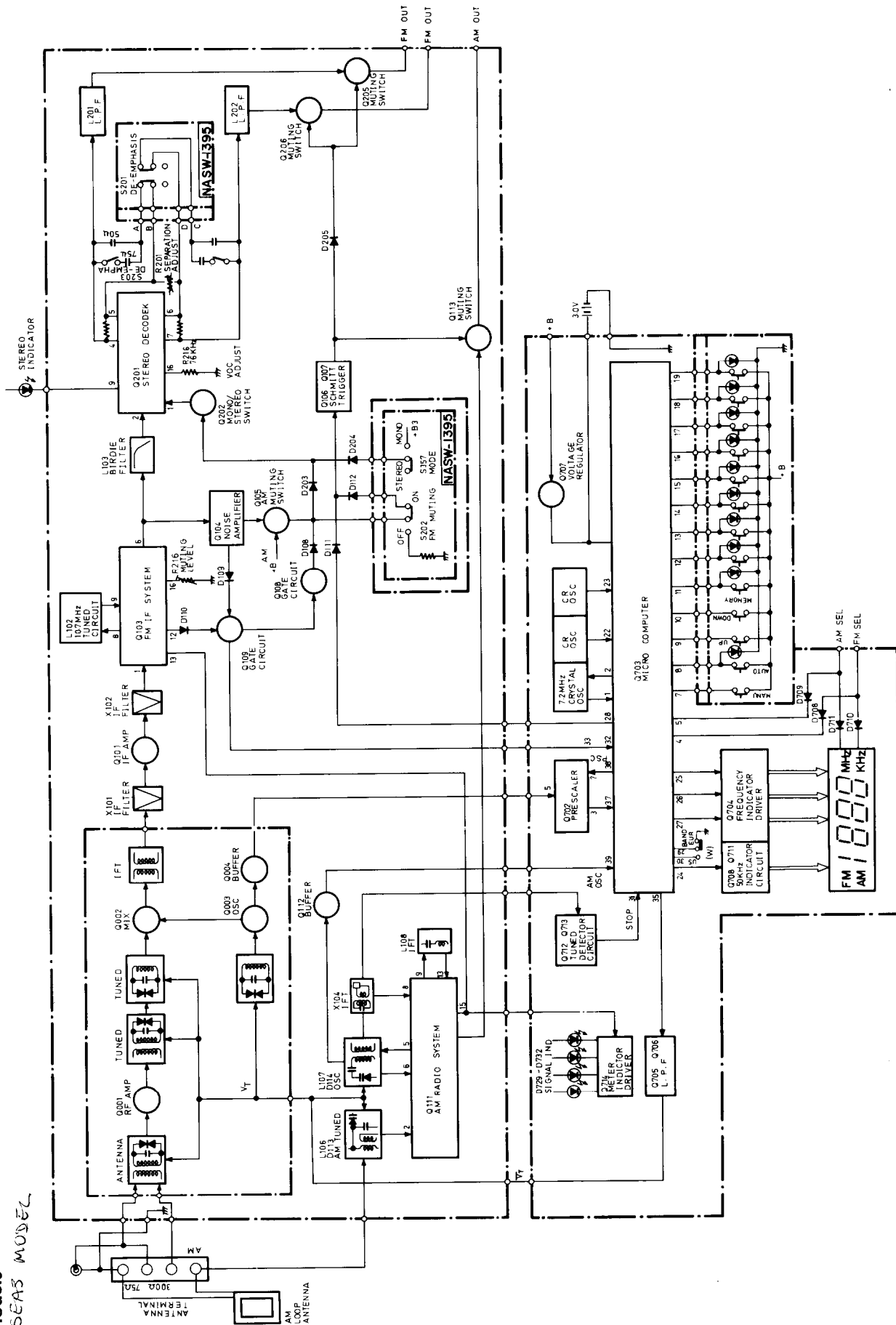
Some models are equipped with a voltage selector to conform with local power supplies.

Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.



BLOCK DIAGRAM

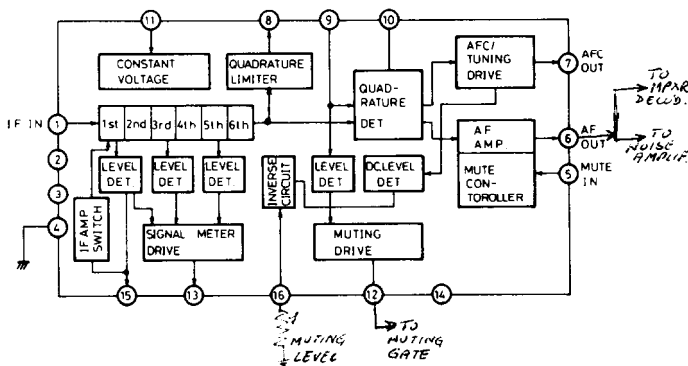
-TUNER SECTION-
G/W models
OVERSEAS MODEL



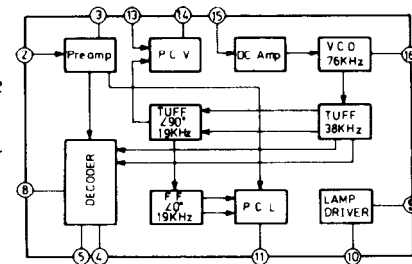


BLOCK DIAGRAM OF IC

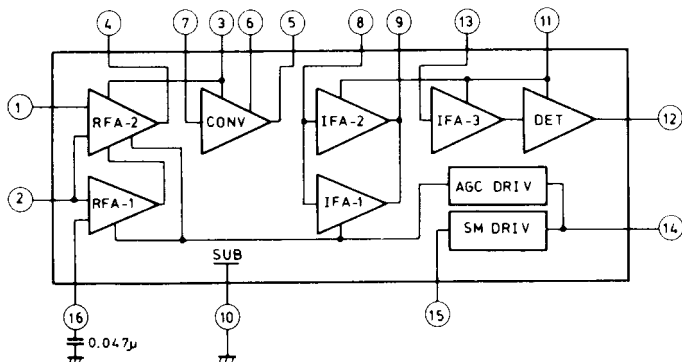
μ PC1167C2 (FM IF system)



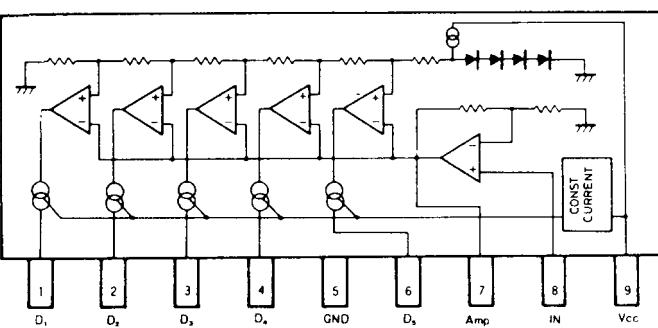
HA 12016 (Stereo decoder)



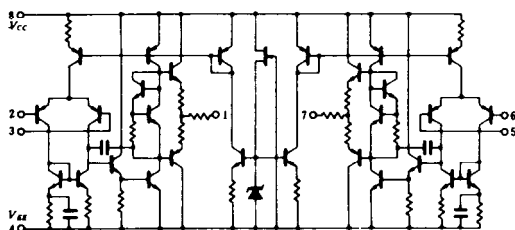
LA1240 (AM radio system)



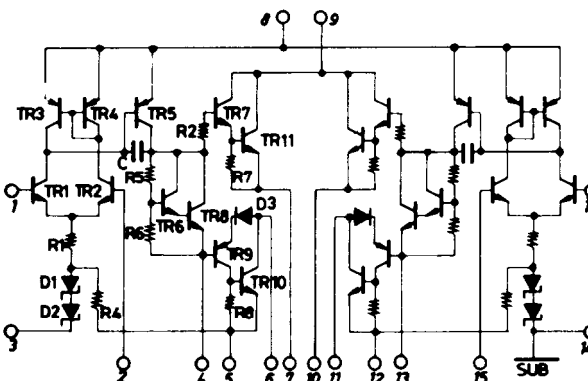
BA6124 (Signal meter driver)



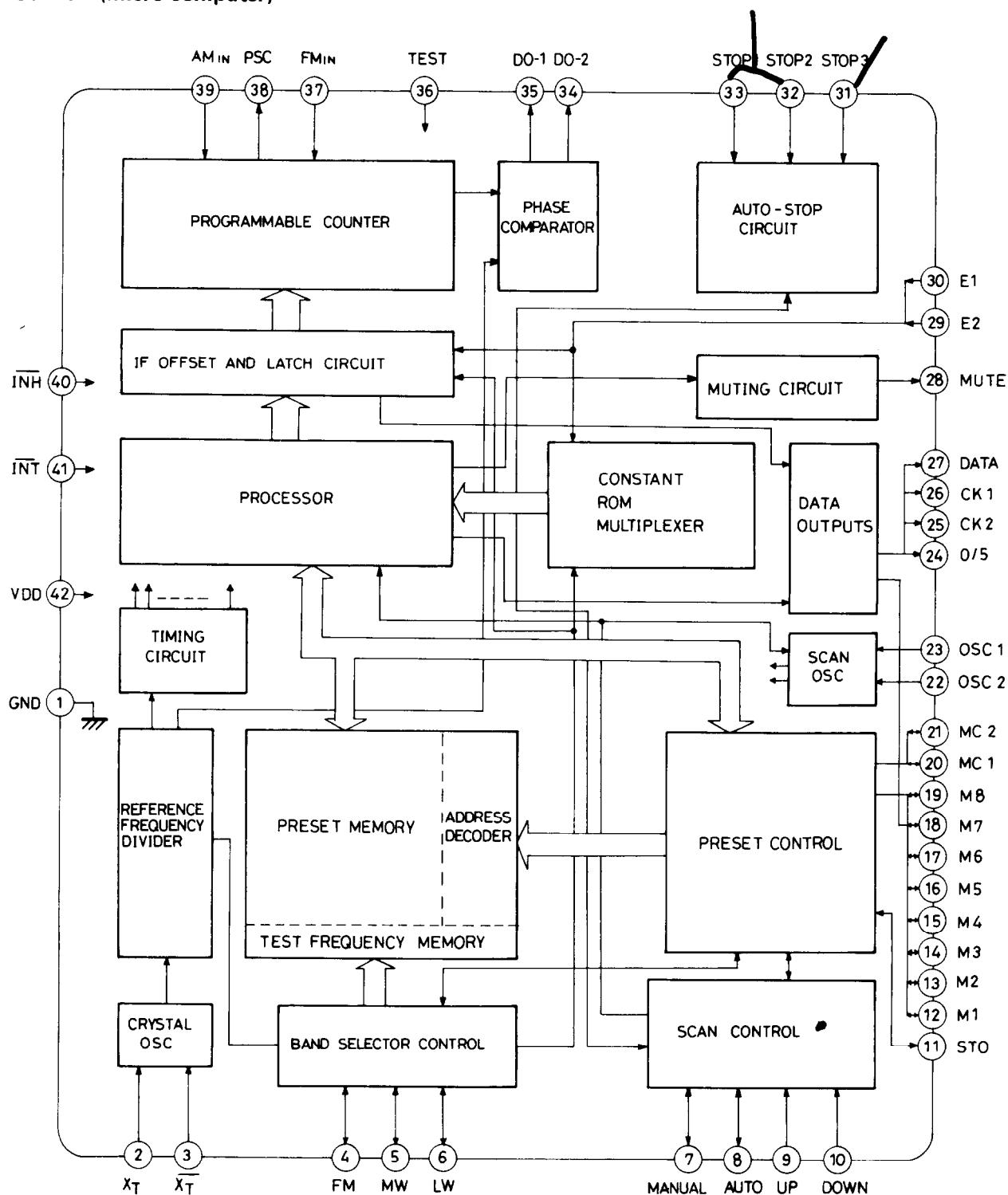
NJM4558D, 4559DX EQUIVALENT CIRCUIT



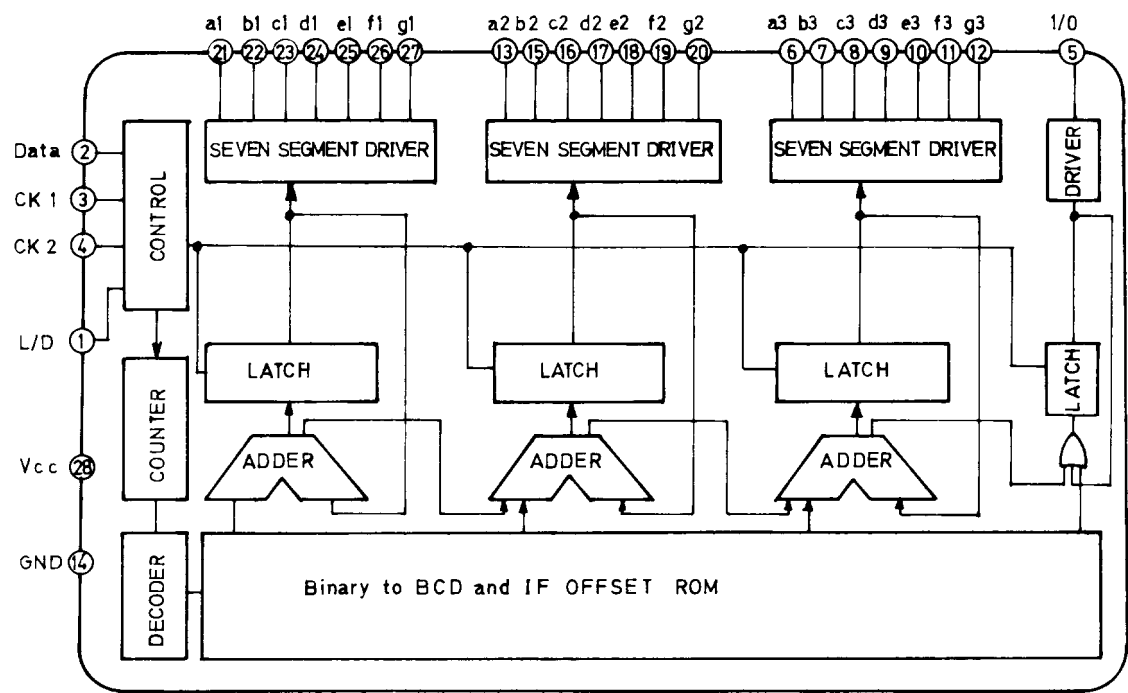
STK-463 EQUIVALENT CIRCUIT



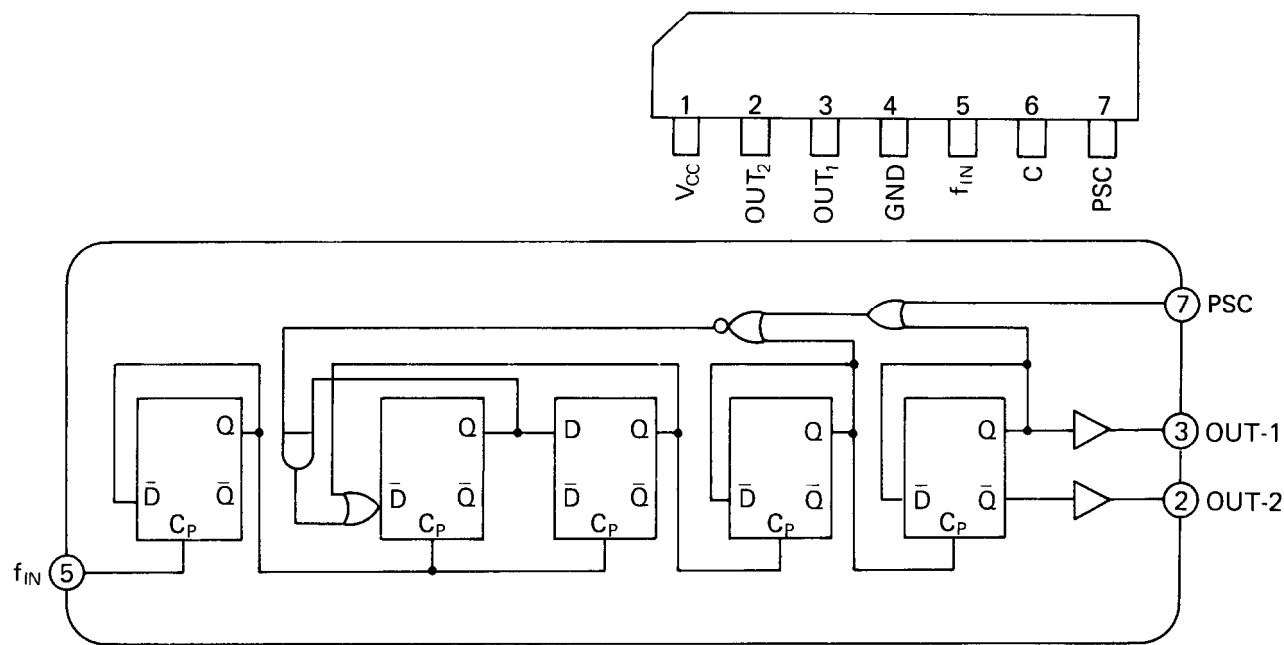
TC9147P (Micro computer)



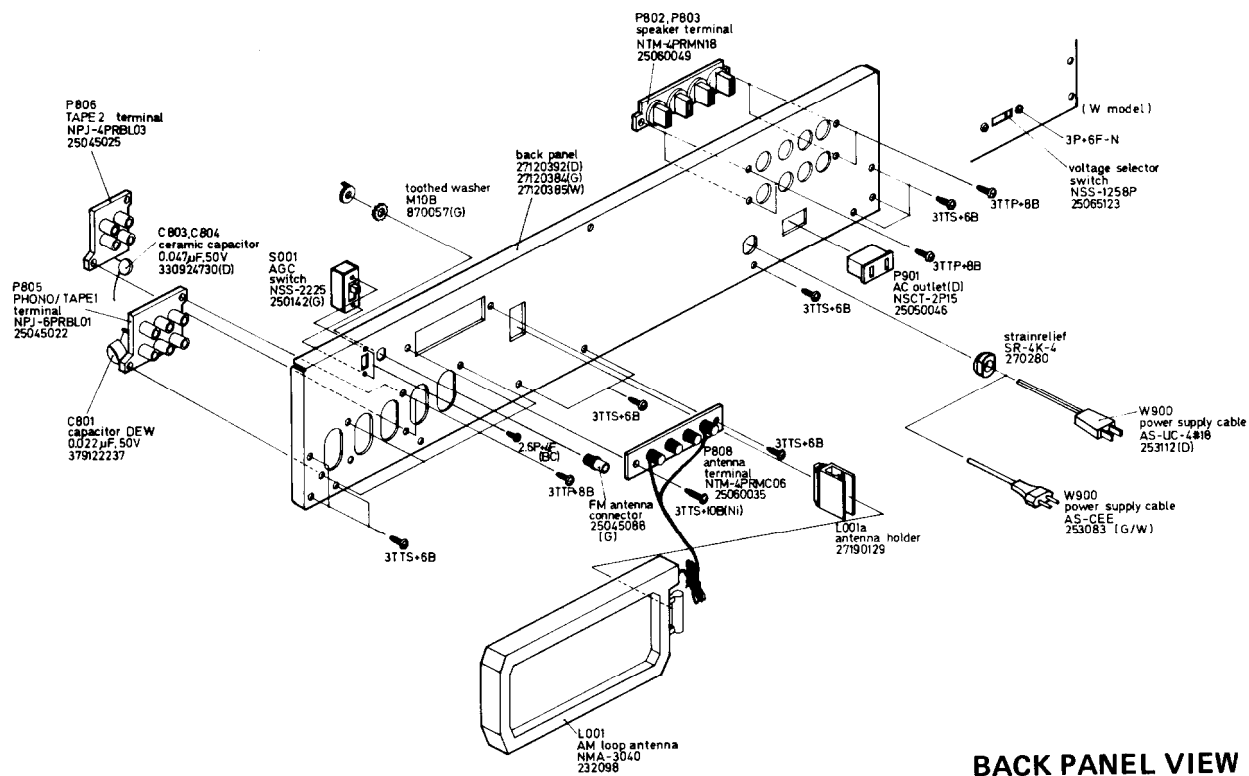
TD6301AP (Fluorescent indicator tube driver)



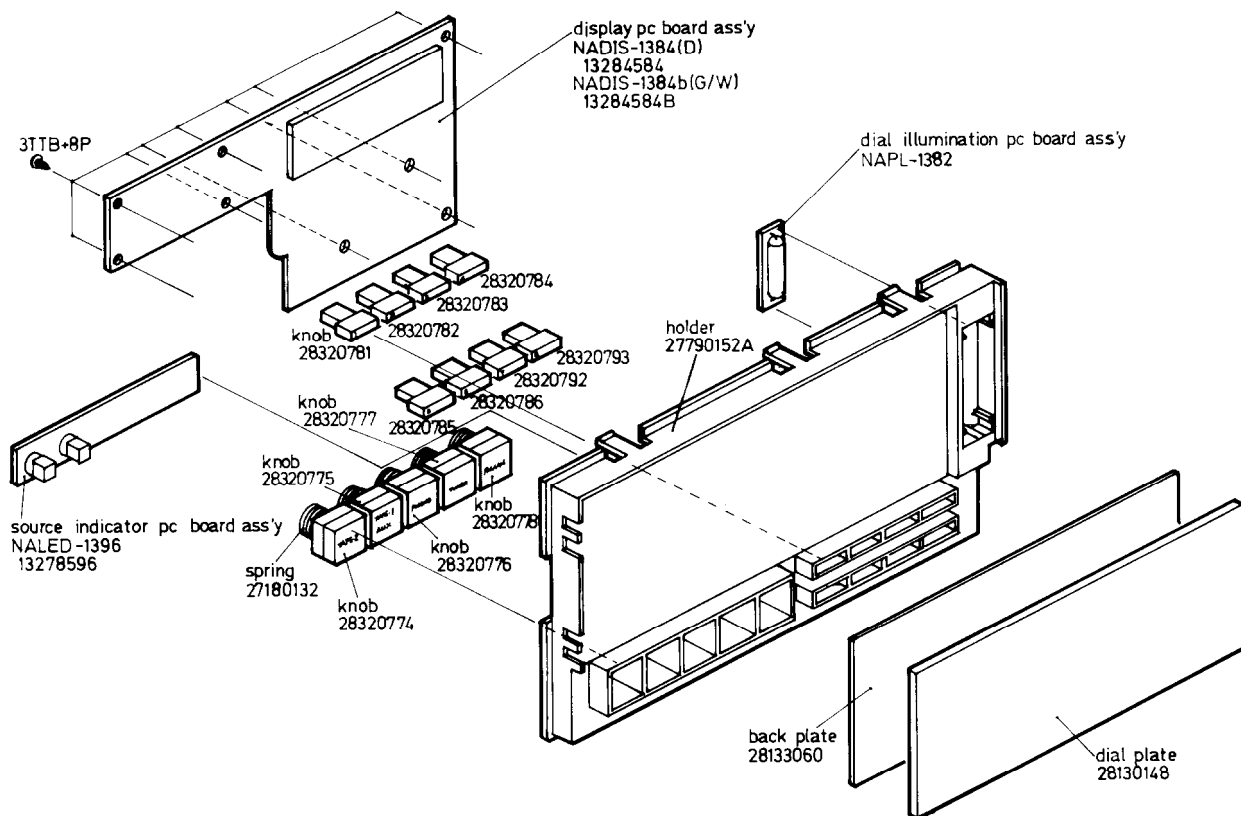
TD6104P (Prescaler)



EXPLODED VIEW



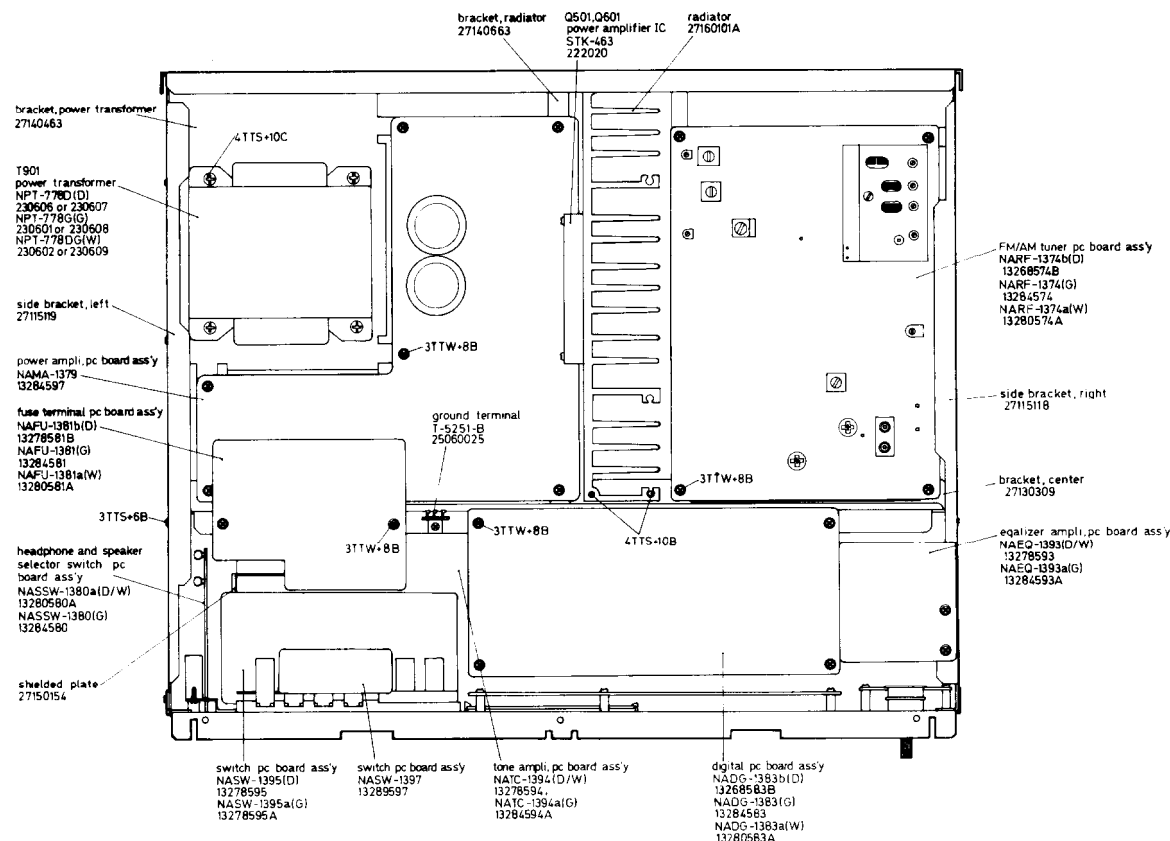
BACK PANEL VIEW



HOLDER VIEW



COMPONENT LOCATION



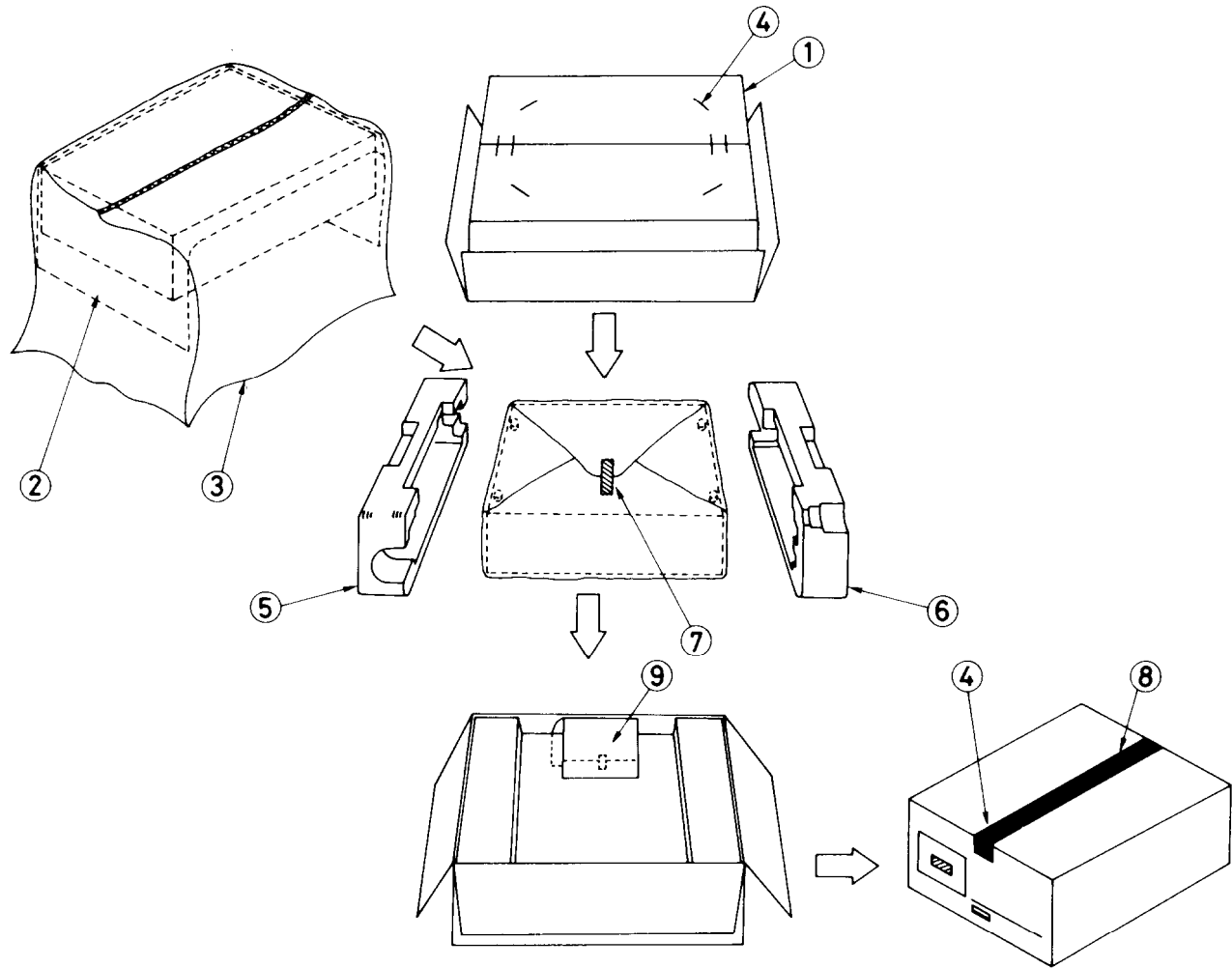
PARTS LIST

| REF. NO. | PARTS NO. | DESCRIPTION | REF. NO. | PARTS NO. | DESCRIPTION |
|----------|-----------|----------------------------|----------|------------|-----------------|
| A1 | 27110169A | Front bracket | A506 | 27267192 | Guide, mode |
| A4 | 27130308 | Bracket, lamp | A507 | 27267193 | Guide, tuning |
| A5 | 27150154 | Shielded plate | A508 | 28198572 | Facet |
| A6 | 27140658 | Bracket, left side | A631 | 27170131A | Bottom board |
| A7 | 27140659 | Bracket, right side | A632 | 27175009 | Leg |
| A9 | 28130148 | Dial plate | A635 | 27300359 | Lid |
| A10 | 28133060A | Back plate | A801 | 28320543-1 | Knob, volume |
| A17 | 28140126 | 53mm, Cushion | A803 | 28320760 | Knob, power |
| A18 | 28140185 | 40mm, Cushion | A804 | 28320761 | Knob |
| A19 | 28175055 | Insulating plate | A805 | 28320772 | Knob, mode |
| A20 | 27115118 | Side bracket, right | A806 | 28320774 | Knob, tape 2 |
| A21 | 27115119A | Side bracket, left | A807 | 28320775 | Knob, tape 1 |
| A22 | 27130309 | Bracket, center | A808 | 28320776 | Knob, phono |
| A23 | 27130310 | Bracket, power transformer | A809 | 28320777 | Knob, tuning |
| A25 | 27140463 | Bracket, battery | A810 | 28320778 | Knob, FM |
| A26 | 27300360 | Case, battery | A811 | 28320795A | Knob, balance |
| A27 | 27160101A | Radiator | A812 | 28320771A | Knob, tone |
| A28 | 27140663 | Bracket, radiator | A819 | 29320780 | Knob, memory |
| A45 | 27120392 | Back panel (D) | A820 | 13284902 | Knob ass'y |
| | 27120384 | Back panel (G) | A823 | 28320794 | Knob, red |
| | 27120385 | Back panel (W) | | 28320781 | Knob, station 1 |
| A301 | 28184146 | Top cover | | 29320782 | Knob, station 2 |
| A304 | 28140024 | 0.5x10x390mm, Cushion | | 28320783 | Knob, station 3 |
| A501 | 13284121 | Front panel ass'y | | 28320784 | Knob, station 4 |
| A503 | 13284901 | Clear plate ass'y | | 28320785 | Knob, station 5 |
| A504 | 27267179 | Guide, power | | 28320786 | Knob, station 6 |
| A505 | 27267180 | Guide, speaker | | 28320792 | Knob, station 7 |
| | | | | 28320793 | Knob, station 8 |

| REF. NO. | PARTS NO. | DESCRIPTION | REF. NO. | PARTS NO. | DESCRIPTION |
|------------|----------------------|-----------------------------------------------------|--------------------------------------------------------------------------|-----------|-----------------------------------------------------------|
| C801 | 379122237 | 0.022 μ F, 50V, Capacitor, DEW (D/W) | U8 | 13278581B | NAFU-1381b, Fuse terminal pc board ass'y (D) |
| | 379124737 | 0.047 μ F, 50V, Capacitor, DEW (G) | | 13284581 | NAFU-1381, Fuse terminal pc board ass'y (G) |
| C803, C804 | 330924730 | 0.047 μ F, 50V, Capacitor, ceramic (D) | | 13280581A | NAFU-1381a, Fuse terminal pc board ass'y (W) |
| C900 | 3500060 | 0.01 μ F, 125V, Capacitor CS (D) | U9 | 13284582 | NAPL-1382, Dial illumination lamp pc board ass'y |
| | 3500065A | 0.01 μ F, 240V, Capacitor IS (G/W) | | 13268583B | NADG-1383b, Digital circuit pc board ass'y (D) |
| C900a | 27300080 | Cover, capacitor | | 13284583 | NADG-1383, Digital circuit pc board ass'y (G) |
| F501, F601 | 252059 | 4A (SS-2), Speaker protection fuse (D) | U10 | 13280583A | NADG-1383a, Digital circuit pc board ass'y (W) |
| | 252076 | 3.15A-SE-EAK, Speaker protection fuse (G) | | 13284584 | NADIS-1384, Fluorescent indicator tube pc board ass'y (D) |
| | 252014 | 4A-T, Speaker protection fuse (W) | U11 | 13284584B | NADIS-1384b, Fluorescent indicator tube ass'y (G/W) |
| F902 | 252049 | 4A (ST-6), Primary fuse (D) | | 13284585 | NADIS-1385, Operation switch pc board ass'y |
| F901 | 252074 | 2A-SE-EAK, Primary fuse (G/W) | U12 | 13278597 | NASW-1397, Switch circuit pc board ass'y |
| F902 | 252014 | 4A-T, Primary fuse (W) | U13 | 13280586 | NASW-1386, FM/AM band selector switch pc board ass'y (W) |
| L001 | 232098 | NMA-3040, Am loop antenna | W900 | 253112 | AS-UC-4, Power wupply cable (D) |
| L001a | 27190129 | Holder, antenna | | 2503083 | AS-CEE, Power supply cable (G/W) |
| P802, P803 | 25060049 | NTM-4PRMN18, Speaker terminal | W900a | 270280 | SR-4K-4, Strainrelief |
| P805 | 25045022 | NPJ-6PRBL01, Tape 1 and Phono terminal | | 25060025 | T-5251-B, Ground terminal |
| P806 | 25045025 | NPJ-4PRBL03, Tape 2 terminal | NOTE: D: Only 120V model G: Only 220V model W: Only 120/220V model | | |
| P808 | 25060035 | NTM-4PRMC06, Antenna terminal | | | |
| P809 | 25045088 | FM antenna connector (G) | | | |
| P809a | 870057 | M10B, Toothed washer (G) | [screws] | | |
| Q501, Q601 | 222020 | STK-463, Power amplifier IC | | | |
| R900 | 431523355 | 3.3M Ω , 1/2W, Resistor, solid (D) | | | |
| R360, R460 | 5147013 | N16RG100KBT35, Volume control variable resistor | | | |
| R375 | 5104137A | N16RC100KW25, Balance control variable resistor | | | |
| S900 | 25035321 or 25035135 | NPS-111-L285P or NPS-111-L100P, Power switch (D) | | | |
| S900 | 25035322 or 25035176 | NPS-111-L286P or NPS-111-L140P, Power switch (G/W) | | | |
| S001 | 250142 | NSS-2225, AGC switch (G) | | | |
| S902 | 25065123 | NSS-1258P, Voltage selector switch | | | |
| P901 | 25050046 | NSCT-2P15, AC outlet (D) | | | |
| T901 | 230606 or 230607 | NPT-778D or NPT-781D, Power transformer (D) | | | |
| | 230601 or 230608 | NPT-778G or NPT-781G, Power transformer (G) | | | |
| | 230602 or 230609 | NPT-778DG or NPT-781DG, Power transformer (W) | | | |
| U1 | 13268574B | NARF-1374b, FM/AM tuner pc board ass'y (D) | | | |
| | 13284574 | NARF-1374, FM/AM tuner pc board ass'y (G) | | | |
| | 13280574A | NARF-1374a, FM/AM tuner pc board ass'y (W) | | | |
| U2 | 13278593 | NAEQ-1393, Equalizer amplifier pc board ass'y (D/W) | | | |
| | 13284593A | NAEQ-1393A, Equalizer amplifier pc board ass'y (G) | | | |
| U3 | 13278594 | NATC-1394, Tone amplifier pc board ass'y (D/W) | | | |
| | 13284594A | NATC-1394A, Tone amplifier pc board ass'y (G) | | | |
| U4 | 13278595 | NASW-1395, Switch pc board ass'y (D) | | | |
| | 13278595A | NASW-1395a, Switch pc board ass'y (G/W) | | | |
| U5 | 13278596 | NALED-1396, Source indicator pc board ass'y | | | |
| U6 | 13284579 | NAMA-1379, Power amplifier pc board ass'y | | | |
| U7 | 13280580A | NASSW-1380a, Speaker switch pc board ass'y (D/W) | | | |
| | 13284580 | NASSW-1380, Speaker switch pc board ass'y (G) | | | |

| | PARTS NO. | DESCRIPTION |
|-------------------|-----------|-------------|
| 3TTB + 6B | 838130068 | Bind |
| 3TTS + 6B | 834130068 | Tapping |
| 3P + 6FN | 82113006 | Pan head |
| 3P \pm 6BQ (Ni) | 801143 | Pan head |
| 3TTW + 8B | 831130088 | Tapping |
| 3TTS + 8B | 834130088 | Tapping |
| 3TTP + 8P | 833130080 | Tapping |
| 3TTS + 10B (Ni) | 834230108 | Tapping |
| 3TTS + 16B | 834130168 | Tapping |
| 4TTB + 8C (BC) | 838440089 | Tapping |
| 4TTS + 10B | 834140108 | Tapping |
| 3TTW + 6B | 831130068 | Tapping |
| 3TTS + 12B | 834130128 | Tapping |

PACKING VIEW



| REF. NO. | PARTS NO. | DESCRIPTION |
|----------|------------|-----------------------------|
| 1 | 29050556 | Master carton box |
| 2 | 29095012-1 | 500x800mm, Protection sheet |
| 3 | 29100034 | 850x650mm, Poly-vinyl bag |
| 4 | 282301 | Sealing hook |
| 5 | 29090693 | Pad, right side |
| 6 | 29090692 | Pad, left side |
| 7 | 29110032 | Adhesive tape |
| 8 | 260012 | Damplon tape |
| 9 | | Accessory bag ass'y |

(U.S.A. model)

| | |
|------------|---------------------------|
| 29340608 | Instruction manual |
| 292064A | FM antenna |
| 29365006-3 | Warranty card |
| 29358002 | Service station list |
| 29100006 | 250x350mm, Poly-vinyl bag |
| 3010054 | Battery |

(120V model)

| | |
|----------|---------------------------|
| 29340608 | Instruction manual |
| 292064A | FM antenna |
| 29100006 | 250x350mm, Poly-vinyl bag |
| 3010054 | Battery |

| REF. NO. | PARTS NO. | DESCRIPTION |
|----------|------------|-----------------------------|
| | | (West Germany model) |
| | 29340603 | Instruction manual |
| | 292064A | FM antenna |
| | 29365005-3 | Warranty card |
| | 29100006 | 250x350mm, Poly-vinyl bag |
| | | (220V model) |
| | 29340603 | Instruction manual |
| | 292064A | FM antenna |
| | 29100006 | 250x350mm, Poly-vinyl bag |

(120/220V model)

| | |
|----------|---------------------------|
| 29340603 | Instruction manual |
| 292064A | FM antenna |
| 25055040 | CV-K-2, Conversion plug |
| 29100006 | 250x350mm, Poly-vinyl bag |

ADJUSTMENT PROCEDURES

INSTRUMENTS REQUIRED

1. DC Voltmeter
2. AM Sweep Generator
3. AM/FM Signal Generator
4. AC VTVM
5. Oscilloscope
7. Distortion Analyzer
8. Stereo Modulator
9. Frequency Counter

1. +B2 voltage adjustment

(1) D model

Connect the DC voltmeter between the +B2 and E terminals. Adjust the Semi-fixed resistor R909 so that the indication of voltmeter becomes 25V.

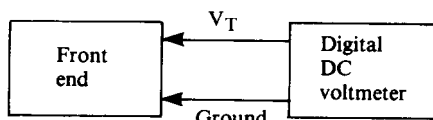
(2) G/W models

Connect the DC voltmeter between the +B2 and E terminals. Adjust the R909 so that the indication of voltmeter becomes 26.8V. (Before change of zener diode of D714) Adjust the R909 so that the indication of voltmeter becomes 25V. (After change of D714)
Note: When this voltage is low, the fluorescent indicator tube lights off.

| | | |
|-------------|---------------|--------------|
| Zener diode | Before change | After change |
| | GZA24Y or | RD22E-B2 or |
| | GZA22Z | GZA22X |

The zener diode D714 is located on the digital circuit pc board.

2. Front end adjustment



| Step | Set to dial | Adjust | Output indicator | Adjust for |
|------|-----------------------------------|-------------|----------------------|------------|
| | FM adjustment | | | |
| 1 | 88.1 MHz | L008 (LO) | Digital DC voltmeter | 3.03V |
| 2 | 107.9MHz | TC004 (TCO) | | 20.8V |
| 3 | Repeat steps 1 and 2 as necessary | | | |
| | AM adjustment (D model) | | | |
| 1 | 600 kHz | L107 | Digital DC voltmeter | 2.5V |
| 2 | 1400 kHz | C156 | | 15.5V |
| 3 | Repeat steps 1 and 2 as necessary | | | |
| | AM adjustment (G/W models) | | | |
| 1 | 603 kHz | L107 | Digital DC voltmeter | 2.5V |
| 2 | 1404 kHz | C156 | | 15.5V |
| 3 | Repeat steps 1 and 2 as necessary | | | |

Remark : Usually not necessary to adjust.

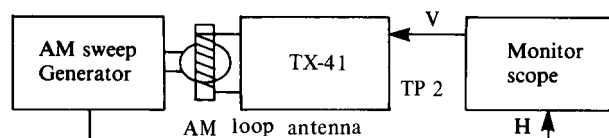
GENERAL ALIGNMENT CONDITIONS

1. Signal input should be kept as low as possible.
2. Standard modulation is 400Hz 30% (AM), 1kHz 100% (FM MONO), pilot 9% sub and main 91% (FM STEREO).
3. Standard knob position

SPEAKERS A
BASS, TERBLE & BALANCE Center
MODE STEREO
LOUDNESS OFF
TAPE 1, 2 OFF (SOURCE)

3. AM IF adjustment

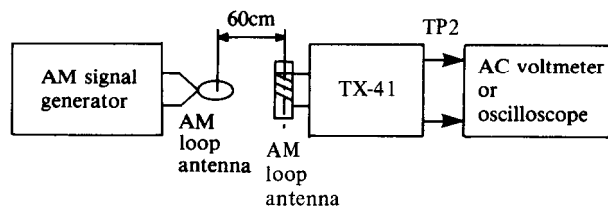
1. Set the dial to quiet point.



| Set signal | Adjust | Adjust for |
|------------|--------|------------------------------------------------------------------|
| 450 kHz | X104 | The output of monitor scope becomes maximum symmetrical response |

Remark : Usually not necessary to adjust.

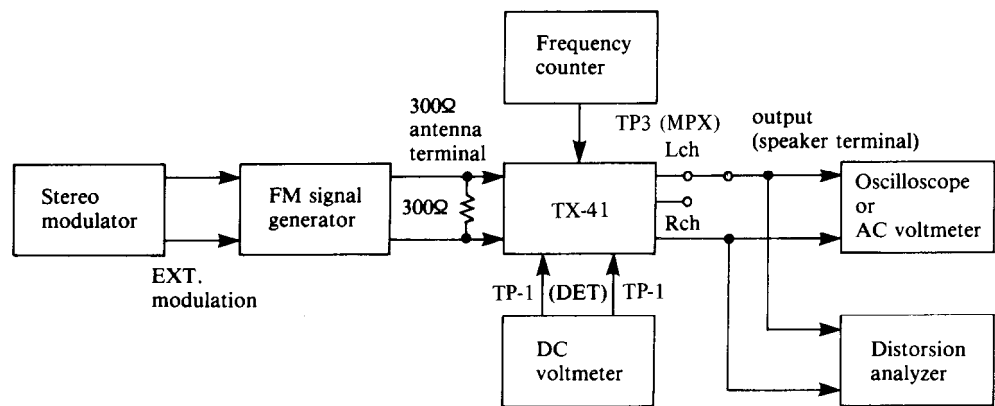
4. AM RF adjustment



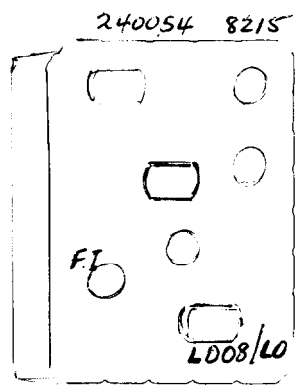
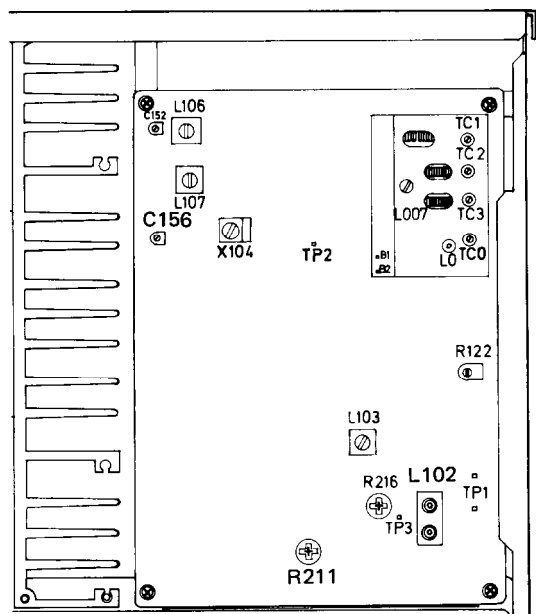
| | AM Signal generator | Dial to set | Adjust | Adjust for |
|---|--------------------------------------|-------------------|--------|------------|
| 1 | 600kHz (603kHz) 400Hz, 30% mod. | 600kHz (603kHz) | L106 | Maximum |
| 2 | 1400kHz (1404kHz) 400Hz, 30% mod. | 1400kHz (1404kHz) | C152 | Maximum |
| 3 | Repeat steps 1 and 2 as necessary | | | |

NOTE : () : 220 V model

5. FM adjustment



| Item | | FM signal generator | Stereo modulator | Dial to set | Adjust | Output indicator | Adjust for | Remarks |
|-------------------|---|-----------------------------------|------------------|-----------------|------------|---------------------|------------|--------------------------------------|
| FM | 1 | | _____ | No input signal | L102 BACK | DC voltmeter | 0V | Repeat steps 1 and 2 as necessary |
| | 2 | 98.1MHz, 65dBf, 1kHz, 75kHz devi. | _____ | 98.1MHz | L102 FRONT | Distorsion analyzer | Minimum | |
| V.C.O | | 98.1MHz 65dBf | _____ | 98.1MHz | R216 | Frequency counter | 76kHz | Turn off the modulation |
| Stereo Separation | | 98.1MHz 65dBf Ext. modulation | Rch | 98.1MHz | R211 | AC voltmeter (Lch) | Minimum | Maximum and same separation |
| | | | Lch | | | AC voltmeter (Rch) | Minimum | |
| Muting level | | 98.1MHz, 17dBf 1kHz, 75kHz devi. | _____ | 98.1MHz | R122 | Oscilloscope | Signal | Set the muting switch to on position |
| | | 98.1MHz, 16dBf 1kHz, 75kHz devi. | _____ | | | | No signal | |



PRINTED CIRCUIT BOARD-PARTS LIST

FM/AM TUNER PC BOARD

CIRCUIT NO. PARTS NO. DESCRIPTION

Front end

240054 FE396U11 [D]
240043 FD236U14 [G/W]

ICs

Q103 222608 μ PC1167C2, FM IF
Q111 222497 LA1240, AM radio system
Q201 222593 HA12016, Stereo decoder

Transistors

Q101 2211722 2SC1923 (R)
Q104 2210746 2SC945A (P)
Q105-Q109 2210746 or 2SC945A (P) or
2211255 2SC1815 (GR)
Q112 2211302 or 2SK68A (L) or
2211303 2SK68A (M)
Q113, Q202 2210746 or 2SC945A (P) or
2211255 2SC1815 (GR)
Q205, Q206 2211705 2SD655E

Diodes (G/W models)

D101-D112 223105, 1S1555,
D115, D118 223133 or DS442X or
D203-D205 223145 1S2076TD
D113, D114 223136 KV1226
D116 4000068 VD1222

Diodes (D model)

D102 4000068 VD1222
D103-D112 223105, 1S1555, 30V \sim C.1A
D101, D115 223133 or DS442X or
D118 223145 1S2076TD
D203-D205
D113, D114 223136 KV1226

Coils

L101 233105 or NCH-1005 or
233024 NCCH-1501
L103 233236 NMC-6027
L104 233122 NCH3013
L105 233031 NMC-9-1
L106 232107 or NMA3045 or
232089 NMA3037
L107 232084 NMO2018
L108 232041 NIT-0509
L201, L202 233107 NMC5002

Transformer

L102 233270 NFIF-6040
L108 232041 NIT-0509

Ceramic filters

X101, X102 3010043 SFE10.7MM [G/W]
X104 3010058 BCFLZ450A
X101, X102 3010006 SFE10.7MA (RED) [D]

Capacitors

C106, C107 352780109 1 μ F, 50V, Elect.
C116 352784799 0.47 μ F, 50V, Elect.
C118 352742209 22 μ F, 16V, Elect.
C119 352742209 22 μ F, 16V, Elect.
C125 352783399 0.33 μ F, 50V, Elect.
C127 352780229 2.2 μ F, 50V, Elect.
C128-C132 352780109 1 μ F, 50V, Elect.
C152, C156 3060010 NTC-20P09, Trimmer
C157 372525114 510pF \pm 5%, 50V, Styrol

CIRCUIT NO. PARTS NO. DESCRIPTION

C164, C166 352741009 10 μ F, 16V, Elect.
C165 352721019 100 μ F, 6.3V, Elect.
C169 352750479 4.7 μ F, 25V, Elect.
C170 352780339 3.3 μ F, 50V, Elect.
C173 352744709 47 μ F, 16V, Elect.
C176 352741019 100 μ F, 16V, Elect. [G/W]
C201 352741009 10 μ F, 16V, Elect.
C202 352744719 470 μ F, 16V, Elect.
C203, C204 352742209 22 μ F, 16V, Elect.
C205, C206 372524714 470pF \pm 5%, 50V, Styrol
C207 352780339 3.3 μ F, 50V, Elect.
C208 352780109 1 μ F, 50V, Elect.
C209 352780339 3.3 μ F, 50V, Elect.
C210 372521024 1,000pF \pm 5%, 50V, Styrol
C215, C216 352780339 3.3 μ F, 50V, Elect.
C217, C218 372521024 1,000pF \pm 5%, 50V, Styrol [D]
C217, C218 372525614 560pF \pm 5%, 50V, Styrol [G]
C217-C220 372525614 560pF \pm 5%, 50V, Styrol [W]

Resistors

R122 5215023 N08HR50KBC, Semi-fixed
R211 5225037 N10HR220KBD, Semi-fixed
R216 5225029 N10HR3.3KBD, Semi-fixed

Switch

S201 250142 NSS-2225, De-emphasis selector [W]

Screws

82142604 2.6P+4F (BC), Pan head, de-emphasis [W]

Note: [D]: only 120V model
[G]: only 220V model
[W]: only 120/220V model

PRINTED CIRCUIT BOARD VIEW FROM COMPONENT SIDE

DIGITAL CIRCUIT PC BOARD

PRINTED CIRCUIT BOARD-PARTS LIST

DIGITAL CIRCUIT PC BOARD (NADG-1383b)

D model

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-----------------------|------------|------------------------------------|
| ICs | | |
| Q702 | 222675 | TD-6104P, Prescaler |
| Q703 | 222674 | TC-9147P, Micro computer |
| Q704 | 222673 | TD6301AP, Driver, fluorescent tube |
| Q714 | 222670 | BA6124, Signal meter driver |
| Transistors | | |
| Q705 | 2211303 | 2SK68A (M) |
| Q706, Q707 | 2211255 or | 2SC1815 (GR) or |
| Q712 | 2210746 | 2SC954A (P) |
| Q713 | 2211303 | 2SK68A (M) |
| Diodes | | |
| D701-D712 | 223103, | 1S1555, |
| D716-D718 | 223133 or | DS442X or |
| | 223145 | 1S2076TD |
| D715 | 223944 or | RD4.7E-B or |
| | 223943 | RD4.7E-C |
| Crystal | | |
| X701 | 3010073 | XTL-7.2M |
| Ceramic filter | | |
| X702 | 3010048 | CFM2-450ZL |
| Capacitors | | |
| C702 | 352761009 | 10 μ F, 35V, Elect. |
| C704 | 395162297 | 0.22 μ F, 35V, Tantalum |
| C706 | 352721029 | 1,000 μ F, 6.3V, Elect. |
| C708 | 352761009 | 10 μ F, 35V, Elect. |
| C711 | 352780109 | 1 μ F, 50V, Elect. |
| C712 | 352780229 | 2.2 μ F, 50V, Elect. |
| C713 | 352784799 | 0.47 μ F, 50V, Elect. |
| C714 | 352734709 | 47 μ F, 10V, Elect. |

CIRCUIT NO. PARTS NO. DESCRIPTION

| | | |
|------------------|-------------|------------------------------------|
| C719 | 352741009 | 10 μ F, 16V, Elect. |
| C726, C727 | 352741009 | 10 μ F, 16V, Elect. |
| Resistors | | |
| R750 | 441626804 | 68 Ω , 1W, Metal oxide film |
| Z701 | 49121333509 | 33k Ω ×9, 1/8W, Network |
| Z702 | 49121333513 | 33k Ω ×13, 1/8W, Network |

DIGITAL CIRCUIT PC BOARD (NADG-1383)

G/W models

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|--------------------|------------|------------------------------------|
| ICs | | |
| Q702 | 222675 | TD6104P, Prescaler |
| Q703 | 222674 | TC9147P, Micro computer |
| Q704 | 222673 | TD6301AP, Driver, fluorescent tube |
| Q714 | 222670 | BA6124, Signal meter driver |
| Transistors | | |
| Q705 | 2211303 | 2SK68A (M) |
| Q706-Q710 | 2211255 or | 2SC1815 (GR) or |
| | 2210746 | 2SC954A (P) |
| Q711 | 2211454 or | 2SA1015 (Y) or |
| | 2211455 | 2SA1015 (GR) |
| Q712 | 2211255 or | 2SC1815 (GR) or |
| | 2210746 | 2SC945A (P) |
| Q713 | 2211303 | 2SK68A (M) |
| Diodes | | |
| D701-D713 | 223103, | 1S1555, |
| D716-D718 | 223133 or | DS442X or |
| D735, D736 | 223145 | 1S2076TD |
| D714 | 2241252 or | GZA24Y or |
| | 2241233 | GZA22Z (Before change) |
| | 2239752 or | RD22E-B2 or |
| | 2241231 | GZA22X (After change) |

CIRCUIT NO. PARTS NO. DESCRIPTION

Note: When replace this diode (D714), use the zener diode of after change. Confirm that the +B2 voltage is 25 volts. When this voltage is low, the fluorescent tube light off.

| | | |
|------------|-----------------------|------------------------------------|
| D715 | 223944 or 223943 | RD4.7E-B or RD4.7E-C |
| | Crystal | |
| X701 | 3010073 | XTL-7.2M |
| | Ceramic filter | |
| X702 | 3010048 | CFM2-450ZL |
| | Capacitors | |
| C702 | 352761009 | 10 μ F, 35V, Elect. |
| C704 | 395162297 | 0.22 μ F, 35V, Tantalum |
| C706 | 352724719 | 470 μ F, 6.3V, Elect. |
| C708 | 352761009 | 10 μ F, 35V, Elect. |
| C711 | 352780109 | 1 μ F, 50V, Elect. |
| C712 | 352780229 | 2.2 μ F, 50V, Elect. |
| C713 | 352784799 | 0.47 μ F, 50V, Elect. |
| C714 | 352734709 | 47 μ F, 10V, Elect. |
| C719 | 352741009 | 10 μ F, 16V, Elect. |
| C726, C727 | 352741009 | 10 μ F, 16V, Elect. |
| | Resistors | |
| R750 | 441626804 | 68 Ω , 1W, Metal oxide film |
| Z701 | 49121333509 | 33k Ω ×9, 1/8W, Network |
| Z702 | 49121333513 | 33k Ω ×13, 1/8W, Network |

DISPLAY PC BOARD (NADIS-1384 a/b)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-------------|-----------------------------------|-----------------|
| | Fluorescent indicator tube | |
| Q701 | 212016 | FIP7B8CS |
| | L.E.Ds | |
| D721-D728 | 225057 | SR538D |
| D729-D732 | 225028-3 | GL9PG59C |
| D733 | 225029 | GL9PR9 |
| | Switch | |
| S701-S708 | 25035275 | NPS-111-S239 |
| | Holder | |
| | 27190152 | |
| | Screws | |
| | 833130080 | 3TTP+8P, Tap |
| | Washer | |
| | 870048 | W3×8×0.8, Nylon |
| | Cushion | |
| | 28140417 | |
| | Knobs | |
| | 28320781 | Station 1 |
| | 28320782 | Station 2 |
| | 28320783 | Station 3 |
| | 28320784 | Station 4 |
| | 28320785 | Station 5 |
| | 28320786 | Station 6 |
| | 28320792 | Station 7 |
| | 28320793 | Station 8 |

DISPLAY PC BOARD

PRINTED CIRCUIT BOARD-PARTS LIST

TONE CONTROL PC BOARD (NATC-1394)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-------------------|-----------|---------------------------------------------|
| ICs | | |
| Q351, Q451 | 222534 | NJM-4559DX |
| Capacitors | | |
| C353, C453 | 392880227 | 2.2 μ F, 50V, LL |
| C356, C456 | 392880107 | 1 μ F, 50V, LL |
| C361, C461 | 352742209 | 22 μ F, 16V, Elect. |
| C364, C464 | 352780109 | 1 μ F, 50V, Elect. |
| C366, C367 | 352780339 | 3.3 μ F, 50V, Elect. |
| C369 | 352780339 | 3.3 μ F, 50V, Elect. |
| Resistors | | |
| R363, R463 | 5148080 | N16RGM11C100KCO25M, Treble control variable |
| R370, R470 | 5148081 | N16RGM11C100KCS25M, Bass control variable |
| Switches | | |
| S352-S356 | 25035325 | NPS-262-342-L289, Source selector |

SWITCH PC BOARD (NASW-1395) (D model)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-----------------|-----------|------------------|
| Switches | | |
| S201, S202 | 25035319 | NPS-222-L283 |
| S357-S360 | 25035326 | NPS-422-L290 |
| Bracket | | |
| | 27140664 | Bracket, push |
| Screws | | |
| | 82113006 | 3P+6FN, Pan head |

SWITCH PC BOARD (NASW-1395a) (G /W models)

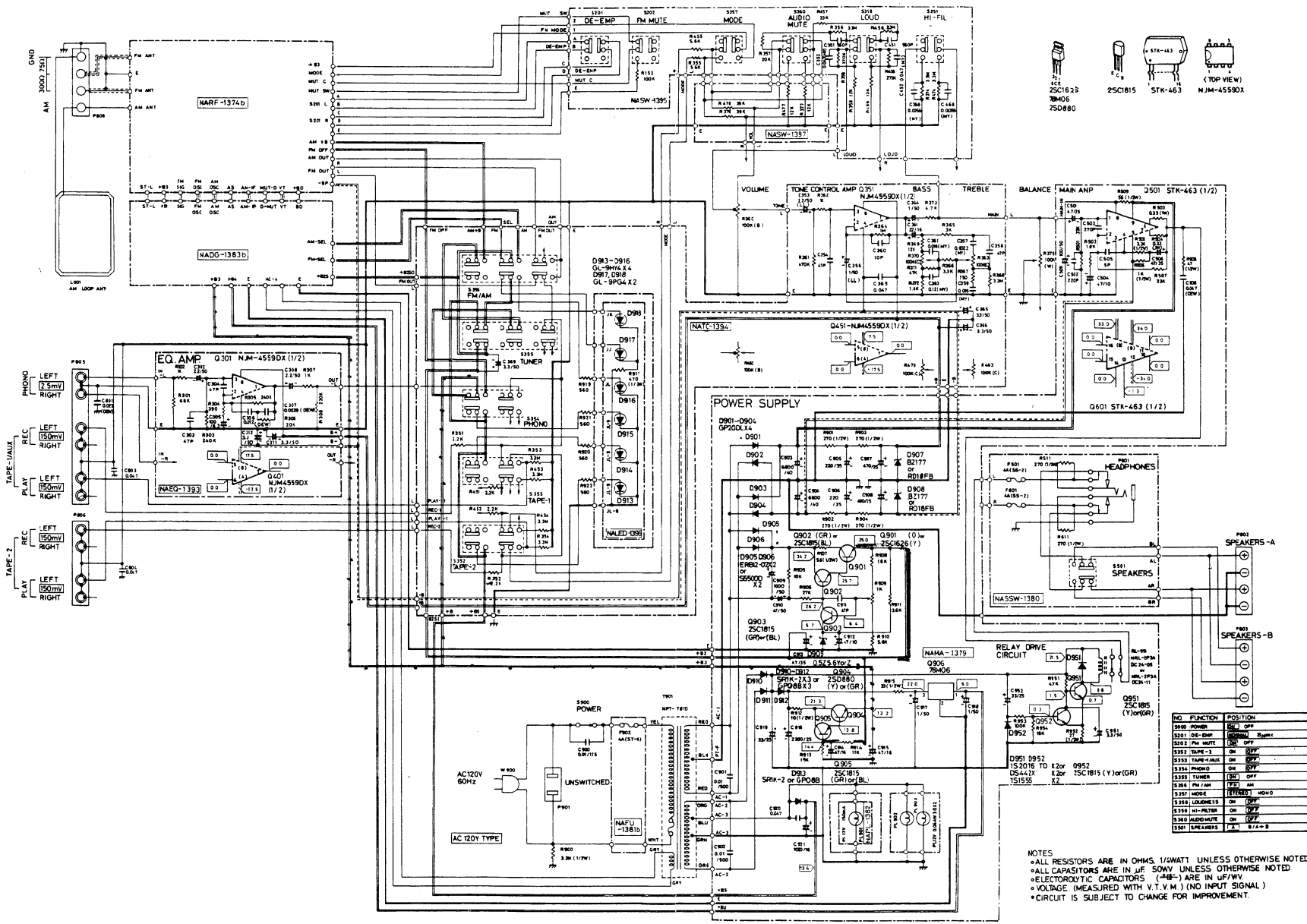
| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-------------------|--------------------------|-----------------------------|
| Transistor | | |
| Q907 | 2210746 or 2211255 | 2SC945A (P) or 2SC1815 (GR) |
| Diode | | |
| D914 | 223145, 223133 or 223105 | 1S2076TD, DS442X or 1S1555 |
| Capacitor | | |
| C922 | 352744709 | 47 μ F, 16V, Elect. |
| Switches | | |
| S201, S202 | 25035319 | NPS-222-L283 |
| S357-S360 | 25035326 | NPS-422-L290 |
| Bracket | | |
| | 27140664 | Switch |
| Screws | | |
| | 82113006 | 3P+6FN, Pan head |

EQUALIZER AMPLIFIER PC BOARD (NAEQ-1393)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-------------------|-----------|---------------------------|
| ICs | | |
| Q301, Q401 | 222534 | NJM-4559DX |
| Capacitors | | |
| C302, C402 | 352780229 | 2.2 μ F, 50V, Elect. |
| C305, C405 | 352721019 | 100 μ F, 6.3V, Elect. |
| C308, C408 | 352780229 | 2.2 μ F, 50V, Elect. |
| C311, C312 | 352780339 | 3.3 μ F, 50V, Elect. |

SCHEMATIC DIAGRAM

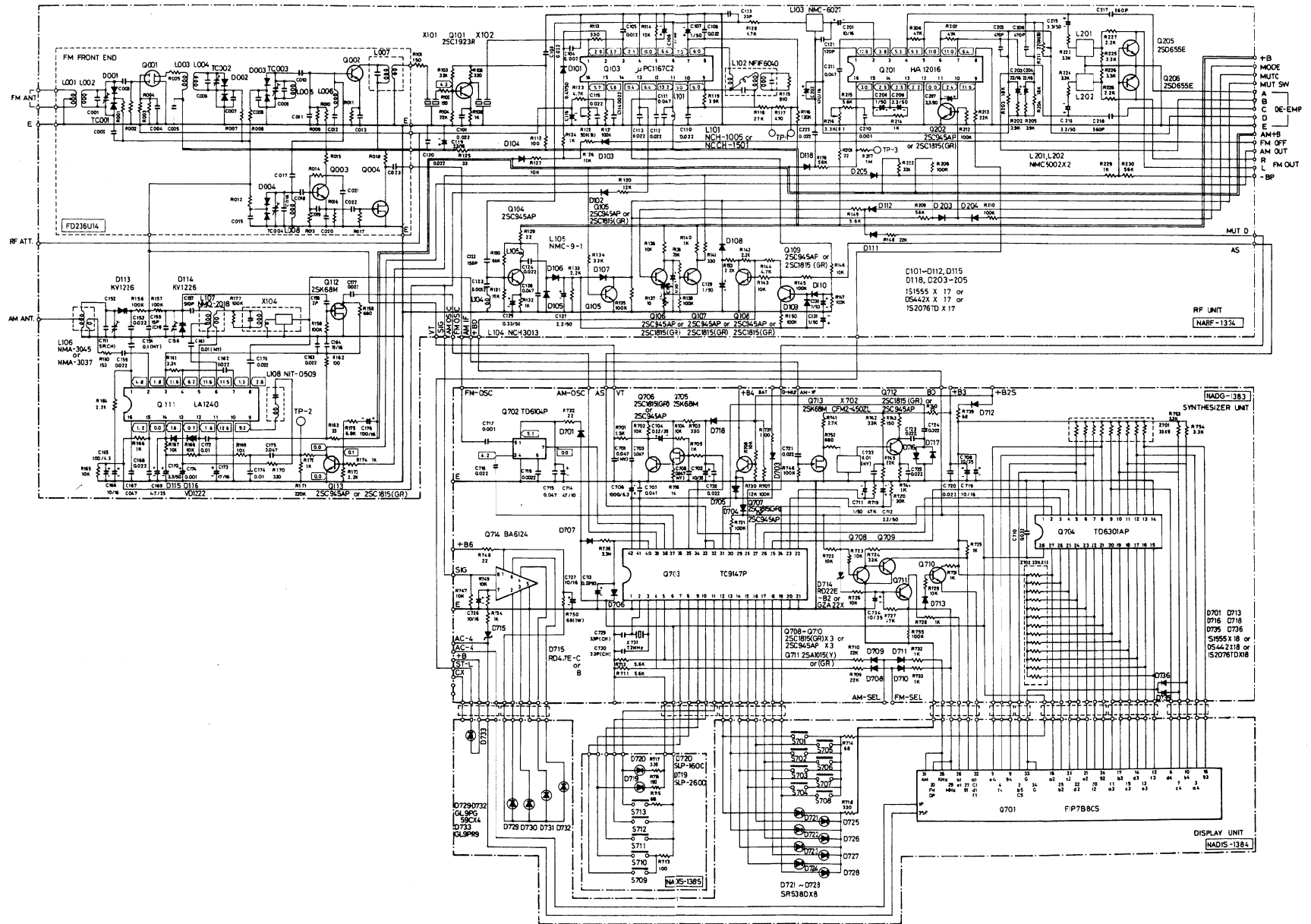
D model



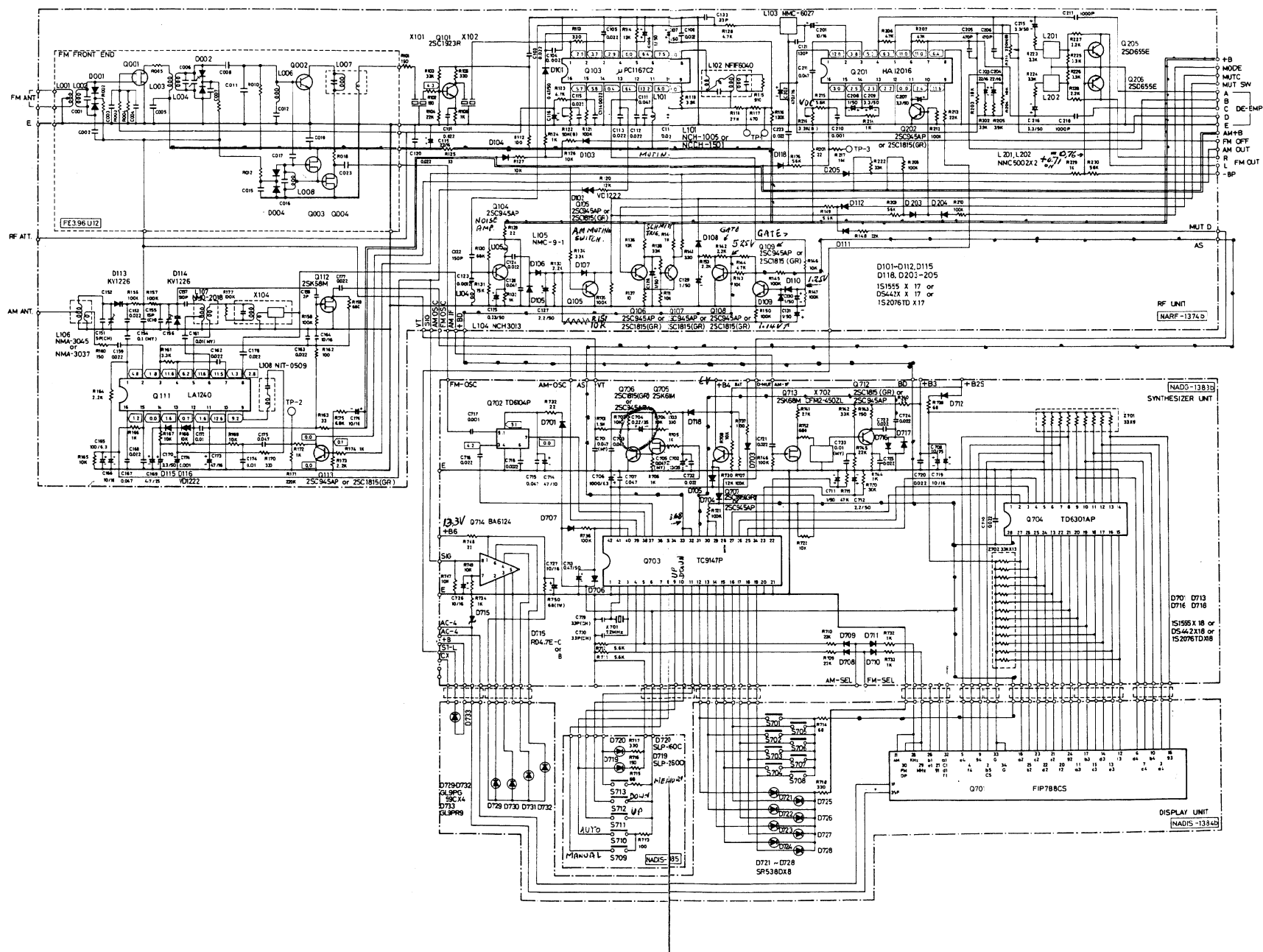
ONKYO CORPORATION

SCHEMATIC DIAGRAM

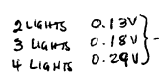
G model



D model



W model



| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-------------------|-------------------------|-----------------------------------------|
| Capacitors | | |
| C501, C601 | 352750479 | 4.7 μ F, 25V, Elect. |
| C504, C604 | 352734709 | 47 μ F, 10V, Elect. |
| C506, C606 | 352764709 | 47 μ F, 35V, Elect. |
| C509 | 352781019 | 100 μ F, 50V, Elect. |
| C903, C904 | 3504169 | 6,800 μ F, 40V, Elect. |
| C905, C906 | 352762219 | 220 μ F, 35V, Elect. |
| C907, C908 | 352754719 | 470 μ F, 25V, Elect. |
| C909 | 352781029 | 1,000 μ F, 50V, Elect. |
| C910 | 352784709 | 47 μ F, 50V, Elect. |
| C912 | 352734709 | 47 μ F, 10V, Elect. |
| C913 | 352764709 | 47 μ F, 35V, Elect. |
| C914, C915 | 352744709 | 47 μ F, 16V, Elect. |
| C916 | 352752229 | 2,200 μ F, 25V, Elect. |
| C917, C918 | 352780109 | 1 μ F, 50V, Elect. |
| C919 | 352751019 | 100 μ F, 25V, Elect. |
| C921 | 352741029 | 1,000 μ F, 16V, Elect. |
| C951 | 352780339 | 3.3 μ F, 50V, Elect. |
| C952 | 352753309 | 33 μ F, 25V, Elect. |
| Resistors | | |
| R503, R603 | 441623394 | 0.33 Ω , 1W, Metal oxide film |
| R504, R604 | | |
| R505, R605 | 441523324 | 3.3k Ω , 1/2W, Metal oxide film |
| R506, R606 | 441521024 | 1k Ω , 1/2W, Metal oxide film |
| R508, R608 | 441520474 | 4.7 Ω , 1/2W, Metal oxide film |
| R509 | 441525604 | 56 Ω , 1/2W, Metal oxide film |
| R901-R904 | 441522714 | 270 Ω , 1/2W, Metal oxide film |
| R907 | 441520564 | 5.6 Ω , 1/2W, Metal oxide film |
| R909 | 5215018 | N8HR1KBC, Semi-fixed |
| R912 | 441521004 | 10 Ω , 1/2W, Metal oxide film |
| R915 | 441523304 | 33 Ω , 1/2W, Metal oxide film |
| R952 | 441522704 | 27 Ω , 1/2W, Metal oxide film |
| Relay | | |
| RL951 | 25065108 or 25065205 | NRL-2P3A-DC24-05 or NRL-2P3A-DC24-11 |
| Radiator | | |
| | 27160029 | RAD-07 |
| Screw | | |
| | 82113008 | 3P+8F-N, Pan head |

PRINTED CIRCUIT BOARD-PARTS LIST

POWER AMPLIFIER PC BOARD (NAMA-1379)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|--------------------|-----------------------------|------------------------------------------------|
| ICs | | |
| Q906 | 222780062 | 7806M, Voltage regulator |
| Q501, Q601 | 222020 | STK-463, Power ampli. |
| Transistors | | |
| Q901 | 2200663 or 2200664 | 2SC1626 (O) or 2SC1626 (Y) |
| Q902, Q903 | 2211255 or | 2SC1815 (GR) or |
| Q905 | 2211256 | 2SC1815 (BL) |
| Q904 | 2201074 or 2201075 | 2SD880 (Y) or 2SD880 (GR) |
| Q951, Q952 | 2211254 or 2211255 | 2SC1815 (Y) or 2SC1815 (GR) |
| Diodes | | |
| D901-D904 | 223845 | GP20DL |
| D905, D906 | 223850 or 223873 | ERB12-02 or S5500D |
| D907, D908 | 224072 or 224000 | BZ177 or RD18FB |
| D909 | 224163 or 224164 | 05Z5.6Y or 05Z5.6Z |
| D910-D913 | 223804 or 223848 | SR1K-2 or GP-08B |
| D951, D952 | 223145, 223133 or 223105 | 1S2076TD, DS442X 1S1555 |
| Lamps | | |
| PL902, PL903 | 210109 | PL14V0.06AW4.0 (Blue lead wire), after change |
| | 210144 | PL12V60mAW3.0 (Black lead wire), before change |

Notes: When replacing the lamp, use the same light.

SPEAKER SELECTOR SWITCH PC BOARD (NASSW-1380)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-------------|------------|------------------------------------------------|
| R511, R611 | 441522714 | 270 Ω , 1/2W, Metal oxide film resistor |
| S501, S502 | 25035329 | NPS-222-L293, Speaker selector switch |
| P801 | 25045109 | HLJ4308-01-040, Stereo headphone jack |
| | 25050065 | YSH403T, Fuse holder [G] |
| | 250113 | SN5051, Fuse holder [D/W] |
| F501, F601 | 252059 | 4A (SS-2), Speaker fuse [D] |
| F501, F601 | 252076 | 3.15A-SE-EAK, Speaker fuse [G] |
| F501, F601 | 252014 | 4A-T, Speaker fuse [W] |
| | 27140668-1 | Bracket, switch |
| | 880009 | Rivert |

FUSE TERMINAL PC BOARD (NAFU-1381)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|------------------|-----------|--------------------------------|
| (D model) | | |
| F902 | 252049 | 4A (ST-6), Primary fuse |
| | 250113 | SN5051, Fuse holder |
| (G model) | | |
| F901 | 252074 | 2A-SE-EAK, Primary fuse |
| | 25050065 | YSH403T, Fuse holder |
| (W model) | | |
| F901 | 252074 | 2A-SE-EAK, Primary fuse (220V) |
| | 25050065 | YSH403T, Fuse holder |
| F902 | 252014 | 4A-T, Primary fuse (120V) |
| | 250113 | SN5051, Fuse holder |

PRINTED CIRCUIT BOARD VIEW FROM COMPONENT SIDE

SOURCE INDICATOR PC BOARD

OPERATION SWITCH PC BOARD

PRINTED CIRCUIT BOARD-PARTS LIST

OPERATION SWITCH PC BOARD (NADIS-1385)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-------------|-----------------|----------------------------|
| | L.E.Ds | |
| D719 | 225093 | SLP-260C, Auto indicator |
| D720 | 225092 | SLP-160C, Memory indicator |
| | Switches | |
| S709-S713 | 25035275 | NPS-111-S239 |
| | Holder | |
| | 27190151 | |
| | Screw | |
| | 834130068 | 3TTS+6B |

FREQUENCY RANGE SELECTOR SWITCH PC BOARD (NASW-1386) (Only W model)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-------------|-----------|------------------------------|
| | 250142 | NSS-2225, Slide switch |
| | 82142604 | 2.6P+4F (BC), Pan head screw |

SELECTOR INDICATOR PC BOARD (NALED-1396)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-------------|-----------------|---------------------------------------|
| | L.E.Ds | |
| D913-D916 | 225112 | GL-9HY84 |
| D917, D918 | 225111 | GL-9PG54 |
| | Resistor | |
| R917 | 442524714 | 470 Ω , 1/2W, Metal oxide film |
| | Spacer | |
| | 27270071 | |

DIAL ILLUMINATION LAMP PC BOARD (NAPL-1382)

| CIRCUIT NO. | PARTS NO. | DESCRIPTION |
|-------------|-----------|----------------------|
| PL901 | 210091 | PL12V150mA, Blue cap |